

those who were capable of taking a very full inspiration and holding it for some time, and were constant on repeated examination. I believe, although the proximity of the valves to each other renders it impossible to speak conclusively, that this accentuated second sound, heard at the spot mentioned, is that of the pulmonary valves, and has become more marked, owing to the fact that during a full inspiration, the heart's action is slower, more laboured, and the circulation of the lung probably interfered with; thus, the pulmonary artery would be distended, and the backward stroke of the column of blood against the semilunar valves be more forcible.

The fact that the heart sounds are in a full inspiration less distinctly heard at points at which they were previously well perceived, may be explained by the lung being carried in front of the heart, which it does more on the left than the right side, and, to some extent, by the relative displacement which occurs during the act of inspiration. The apex, especially, is displaced; it moves down in some persons, by several inches, towards the pit of the stomach, and becomes almost imperceptible at its previous point of impulse. This displacement seems to me to be brought about, not only by the depression of the diaphragm, but by the pressure of the lung on the left side of the heart, a fact of which I have convinced me by observations, which it is only necessary here to allude to, and which will be found elsewhere detailed.¹

ART. IX.—*Notes on the Medical Topography, Climate, and Diseases of Panama, N. G.* By WM. P. BUEL, M. D., Surgeon Pacific Mail Co.

THE city of Panama, by reason of its geographical position, historic associations, and commercial importance, is an object of interest to the philosopher, the statesman, and the man of science. Planted on a narrow neck of land, which connects two great continents, and separates two mighty oceans, it stands like a gateway, through which must pass a great amount of the world's commerce. Already it has regular steam communication, on the east with England, the United States, the West India Islands, and the Atlantic ports of South America; on the west with all the principal ports of the South Pacific; with Central America, Mexico, California, Oregon, and the British possessions. At no remote period, Australia, the Sandwich Islands, and China, will be added to this already extended list.

Topography.—The present town of Panama is situated in lat. $8^{\circ} 57'$ N., and lon. $79^{\circ} 31'$ W.; in the northern half of that tropical belt which supplies us with coffee and sugar; spices and dye-woods; cinchona and

¹ See Transactions of the College of Physicians of December 1st.

sarsaparilla; opium and camphor, and many other most important drugs. The original city stood a few miles to the eastward of the present one. A few ruins are all that remain to mark the ancient site. A venerable old tower still survives, hoary with age; and which, probably, witnessed the mustering of Pizarro and his band of adventurers, when he was about setting forth on his memorable expedition for the conquest of Peru.

The modern town stands at the head of the bay of the same name, on a tongue or neck of land projecting into it. In shape, it is an irregular equilateral triangle, having its base towards the land, and with water on its two sides. A wall and rampart surround it, with bastions and curtains toward the sea, and a ditch on the land side. These fortifications, though they may have been a defence against Morgan and his buccaneers, serve at present to exclude nothing but pure air; and the health of the city would be improved by levelling them to the ground—a process which time and the elements are gradually, but surely accomplishing.

The sides of the triangle are about three-fourths of a mile in length, and the intramural space is regularly laid out in streets, crossing each other at right angles. As in all tropical towns, the streets are narrow; not generally more than 20 feet in width. The houses, from two to three stories in height, are built up with heavy masonry, with balconies projecting from the upper stories over the streets. There is considerable space within the walls not occupied by streets or houses, lying uncultivated, but covered with the dense vegetation of the tropics. Many old churches and convents, deserted and in ruins, furnish evidence of former opulence and large population. Outside the walls, a considerable town has sprung up. The whole population is estimated at from ten to fifteen thousand souls; all, with the exception of a comparatively small foreign population, using the Spanish language. They are by no means generally, however, of pure Spanish blood, but a mongrel race of Spanish, Indian, and African. There are but very few families who claim to be of pure blood; and even of these few, the genealogical tree will not, it is said, bear too close an inspection.

The climate is not friendly to the white races. The light-complexioned children one meets about the streets, are pale and anæmiated, with narrow chests and slender attenuated limbs. The African race, on the contrary, thrive and flourish. Their muscular frames and well-developed limbs offer a striking contrast to those of the white race. Some of the most extraordinary specimens of muscular development we have ever met, are to be found among the negro coal-heavers employed by the mail company. They would form a model for the sculptor.

The geological structure of the neighbourhood of Panama, and, indeed, of the whole isthmus, is volcanic. The mountain ridges shoot up everywhere into peaks and truncated cones; evidently craters of extinct volcanoes. The rocks are all trap or basaltic. The older rocks contain fissures, into which streams of lava, the result of more recent eruptions, containing

boulders of different sizes, have evidently been poured. The soil is a reddish loam, of no great depth, but of extreme fertility; producing, with little cultivation, in great profusion, every variety of tropical growth, whether fruit, plant, or flower. The isthmus is rich in medicinal plants, many of which are known only to the natives. As tonics and febrifuges, they employ Quassia (*Quassia Amara*), Cedron (*Simiba Cedra*), and several varieties of Gentian. The Cedron bean is also regarded as a powerful antidote against the bites of serpents, and stings of scorpions and other poisonous insects. Sarsaparilla grows abundantly upon the isthmus.

The country, in the immediate neighbourhood of Panama, is an irregular plain of several miles in extent; here spreading out into broad and beautiful savannahs, and there rising into sudden and abrupt declivities, some of them several hundred feet in height, but clothed to their summits with a dense vegetation. There are pools and spots of stagnant water in the neighbourhood, but no extensive swamp or marshes. At no great distance from the city, the country becomes broken, and rises into steep hills and mountain ridges, through which the railroad winds its tortuous way, until it reaches the summit, about ten miles from Panama. The isthmus is not distinguished by high mountains. The mighty Andes, when approaching this narrow neck of land, decreases into a ridge of hills seldom attaining the height of a thousand feet. The railroad winding through the irregularities of the mountains, has only a grade of something less than three hundred feet to be overcome.

Climate.—The year divides itself into rainy and dry seasons. The rains commence in the spring—soon after the sun in his journey northward has crossed the equinoctial line—and continuing, with more or less regularity, during the whole period that he is north of the equator, terminate not long before he reaches the line again in his journey south. South of the equator on the South American coasts, the seasons are exactly reversed; there the rains commence about the time of our autumnal equinox, and terminate about the time of our vernal. The law is the same in both cases, viz., the rains follow and accompany the sun. Farther north the rule is exactly reversed. In California, the rainy season is when the sun is in the far south; the dry when it is farthest north. It is easy to see why the cooling process, which takes place in California during the winter months, should condense the atmospheric moisture upon the sides of the mountains, and bring with it copious rains. It is not so easy to explain why the same rule should not hold good in the intertropical regions.

The rains, which at first are but passing showers, gradually increase, and are fully established towards the end of May, when they fall in torrents, sometimes for days in succession, and are accompanied by thunder and lightning of the most terrific description. With the exception of a few days about the 24th of June, called by the natives the *Veranito de San Juan*, analogous to our Indian Summer, the rains continue for six or eight

months. During this time, fogs, calms, and light, variable winds prevail. The air is loaded with so much moisture, that leather cleaned in the morning is often loaded with mould in the evening.

During the wet season the thermometer (Fahr.) ranges from 75° to 85° , seldom falling below the first or rising above the last. This is not an extreme degree of heat; but the extreme humidity, by preventing all evaporation, clogs the perspiration, and produces a sense of oppression not experienced in a dry atmosphere with the same or even a higher temperature.

Towards the end of December the rains diminish in frequency, and with the commencement of the new year the northwest wind sets in. An immediate change follows. The air becomes pure and refreshing, the sky blue and serene. Hardly a cloud is to be seen; and there being but little moisture in the atmosphere, the heat, though ranging from 75° to 90° Fahr., is less oppressive. The nights are almost always cool, with a strong breeze from the northwest, which makes a blanket generally comfortable to sleep under. The early morning is cool and pleasant; but about 9 o'clock the breeze dies away, and from that hour till 2 or 3 o'clock P. M. the heat is intense. The evenings at this season are deliciously cool, the air fresh, the sky without a cloud, and the stars glittering with a splendour known only in the tropics.

Diseases.—Panama has the reputation of being a place of extraordinary insalubrity—a sort of a hot-bed of disease—where the fever which bears its name reigns with undisputed supremacy. This is in a great measure unjust. Among intertropical cities, it is more healthy than the average. When it is considered that it is compactly built, surrounded with walls which exclude the air and prevent free ventilation—that it has no sanitary police, no sewerage—that the filth which in other cities is either carried off in underground sewers or received into deep cesspools, is here left to fester upon the surface—when all these facts are remembered, Panama may be considered a healthy town. A strong evidence on this point is, that no epidemic disease has ever prevailed here extensively—neither cholera, nor yellow fever, nor dysentery, nor any other form of epidemic disease. Sporadic cases of all of them are of occasional occurrence, but seldom or never in an epidemic form. When yellow fever is prevailing at the island of St. Thomas, between which and Aspinwall there is constant intercourse by the semi-monthly steamers, sporadic cases of the same disease often occur on the line of the railroad and at Panama; but the disease does not spread extensively.

The most prevailing diseases, and those which may be considered *endemic*, are dysentery and that form of miasmatic fever variously called Panama, Chagres, or isthmus fever, termed by the natives “calentura.” It is comparatively a mild form of febrile disease, and perfectly controllable by quinia, with very little other medication, and no preliminary treatment. The Spanish physicians, with the attachment to ancient modes and practices so strong in their race, still insist upon bloodletting as an indispensable preliminary to the quinia; thus entailing upon their patients a tedious conva-

lescence in a climate where the vital energies are low, and the recuperative process never rapid.

Bronchial affections are very common among the native population, accompanied oftentimes with obstinate cough and a profuse expectoration. Tubercular phthisis is of occasional occurrence, but is comparatively rare. Smallpox and the other exanthems are met with, but usually in a mild form, and are seldom epidemic.¹

The most sickly period of the year is usually towards the termination of the wet and at the commencement of the rainy season, or the months of September, October, and November. Dysentery is then very common; and also a high grade of bilious fever, which in malignity and fatality falls little short of yellow fever—and is attended by the same yellow tinge of the skin, injected conjunctiva, and irritable stomach which mark so strongly that disease. Quinia, so effectual in the ordinary fevers of the country, is in this almost or quite powerless. It often runs to a fatal termination in from four to eight days from the commencement of the attack, with sometimes hemorrhages from the mouth and gums, and symptoms of congestion in the brain, lungs, or liver. These malignant cases are, happily, not of frequent occurrence.

The foreign population of Panama is not numerous; it is composed of citizens of the United States connected with the railroad company and the Pacific Mail Company in different capacities, and a few French, English, and Germans, engaged in commercial operations. Some few of this class of the foreign residents enjoy uninterrupted health; the majority experience attacks of fever more or less frequently, and in the intervals of exemption suffer from the depressing and debilitating effects of the climate. It may be doubted whether there is any such thing, for natives of northern and temperate regions, as acclimatization in tropical climates, so as to enjoy an exemption from their peculiar diseases equal to that of the native population. If it ever occurs, it must be considered the exception, not the rule.

Hospitals, and Provision for the Sick.—Some years ago, when the tide of California emigration was at its highest pitch, there were at times as many as two or three thousand Americans congregated at Panama, waiting for a passage to California. Among these masses many were destitute, many dissipated and imprudent, and all unaccustomed to the climate. Much sickness, of course, prevailed. To meet this, private hospitals were opened by physicians, as a speculation. This answered very well for those who had funds, but afforded no relief for the large number of destitute. To meet the latter exigency, a public hospital for Americans was opened, supported in part by voluntary subscriptions, and in part by a capitation-tax upon

¹ Since the above was written I learn that about twenty-five years since there was an epidemic of smallpox, which committed extensive ravages. Many people of twenty-five years and upwards are seen about the streets, badly pitted, survivors, doubtless of that epidemic.

passengers. But, with the exigencies that required them, all these have long since ceased to exist. Sick and destitute Americans are succoured by private charity; or, if mariners, by the American consul. The French population have a small hospital, sustained in part by voluntary contributions, and in part by the French government.

For the native population there is a hospital with a permanent endowment. The hospital building was erected for the purpose about ten years since. It stands without the walls, in one of the streets of the suburbs. It is a long one-storied stone structure, and, with its tier of small windows, elevated eight or ten feet above the street, and heavily grated, has more the aspect of a prison than a hospital. It has four or five wards, with a kitchen and office, opening on a corridor with pillars and arches of heavy masonry. Over one of the doors of the main entrance is an inscription with these words: "VENITE AD ME, OMNES VOS QUI LABORATES ET ESTIS ONERATE, ET EGO VOS REFICIAM." The whole aspect of the interior is a sad commentary upon this gracious invitation. The wards are dark and ill-ventilated, scantily furnished with a few old iron bedsteads without mattresses or pillows. The patients are mostly old chronic cases, sent here merely to prevent their dying in the streets, and without the slightest hope or expectation of recovery. And as if to say to every unfortunate patient who enters the place, there is but one possible way of leaving it, a grim display of old coffins, of all sizes and styles, from plain wood to shabby black velvet, occupies the most conspicuous place in the corridor already mentioned. In this country, to be buried in a coffin is a luxury only for the rich. The poor man is borne to the grave in a coffin, the body interred, and the coffin reserved, to be used over and over; so that these hospital coffins may have borne a whole generation to their long home. This place, its inmates, and everything connected with it, wear an appearance of squalid filth and hopeless misery, which are a disgrace to any community calling itself civilized.

PANAMA, N. G., October, 1858.

ART. X.—*Case of Pseudarthrosis of the Bones of both Forearms; Failure of Brainard's Operation, and of Excision.* By R. A. KINLOCK, M. D., Surgeon of the Roper Hospital, Charleston, S. C.

NICHOLAS VANDERWICH, a Hungarian, aged 32 years, of exceedingly robust and athletic appearance, and enjoying perfect health, was admitted into the Roper Hospital, on the 8th of March, 1856, on account of false joints of the bones of each forearm, the result of fractures sustained ten months previously, while residing near Georgetown, S. C. The fractures were occasioned by a heavy chain falling from a height, and striking the forearms while the upper extremities were outstretched, and the hands